

REMARKS

Favorable reconsideration of this application, in light of the following remarks and discussion, is respectfully requested.

Claims 2, 4, 6, 7, and 9 are currently pending in the application. Claim 9 has been allowed. Claim 4 has been indicated as being allowable if rewritten in independent form.

In the outstanding Office Action, Claim 2 was rejected under 35 U.S.C. 102(b) as being anticipated by "Admitted Prior Art" (hereinafter referred to as "APA"). The Official Action is citing Figure 2 as "Admitted Prior Art," however the Applicants note that the depictions in Figures 2A and 2B are referred to merely as "Related Art" in the specification. (See page 1, line 16.) For the reasons discussed below, the Applicant traverses the anticipation rejection.

In the Office Action, Figures 2A and 2B are indicated as anticipating independent Claim 2. However, the Applicants note that a claim is anticipated only if each and every element as set forth in the claims is found, either expressly or inherently described, in a single prior art reference. As will be demonstrated below, Figures 2A and 2B clearly do not meet each and every limitation of independent Claim 2.

Claim 2 of the present application expressly recites a fuel assembly comprising, among other features, a thimble screw locked to the bottom nozzle at a seat with a rotation preventive pin to connect the control rod guide tubes to the bottom nozzle, the thimble screw comprising a drain hole, and a coolant collision portion at a drain hole side of the rotation preventing pin against which the coolant flowing from the distal end toward the spot facing

hole collides in order to increase pressure drop of the coolant during the scram mode. The Applicants submit that Figures 2A and 2B do not disclose a coolant collision portion that increases pressure drop of the coolant during the scram mode.

The Official Action cites pin (17) as the coolant collision portion. The Official Action refers to the feature regarding the increase in pressure drop as a statement of intended use. However, the Applicants respectfully submit that a coolant collision portion having such a feature is not a statement of intended use, but rather a structure feature of the coolant collision portion. The invention of Claim 2 comprises a coolant collision portion to resist against the coolant flowing from the distal end side toward the spot facing hole during the scram mode. By way of illustration, as shown in Figure 11, a water receiving machined portion (26) is provided so as to positively provide a resistance effect against the coolant flowing from the distal end side toward the spot facing hole. On the other hand, although Figures 2A and 2B show a rotation preventive pin (17), they do not disclose that the rotation preventive pin (17) acts as a resistance surface resisting against the coolant flowing from the distal end side toward the spot facing hole. Also, the structure for positively resisting against the coolant flowing from the distal end side toward the spot facing hole during the scram mode as in the water receiving machined portion (26) shown in Figure 11 cannot be read from Figures 2A and 2B. Therefore, the Applicants respectfully disagree with the reason for rejection stated in the Official Action.

The Official Action indicates that placing one's finger in front of a garden hose would clearly demonstrate resistance in the coolant flowing during a scram due to the presence of a

pin (17) in front of a drain hole (15). However, as shown in the attached table (Delany, K. and Sorensen, N.E., NACA TN, 3038 (1953)) in the attached Appendix, the fluid resistance  $C_D$  of a round object is 1.00 (refer to the circled portion (1)), whereas the fluid resistance  $C_D$  of a planar object is 2.2 (refer to the circled portion (2)). Therefore, in a case of a rotation preventive pin (17) that is round as shown in Figure 2A, the fluid resistance  $C_D$  is low, and the rotation preventive pin (17) is not capable of providing resistance against the coolant flowing during a scram, and thus does not anticipate Claim 2.

A detailed and positive structure for supplementing such a low fluid resistance cannot be read from Figures 2A and 2B. Thus, the Applicants request the withdrawal of the anticipation rejection of Claim 2.

Claims 6 and 7 were rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of Danielson et al. (U.S. Patent No. 5,663,993). For the reasons discussed below, the Applicants request the withdrawal of this obviousness rejection.

The basic requirements for establishing a *prima facie* case of obviousness as set forth in MPEP 2143 include (1) there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings, (2) there must be a reasonable expectation of success, and (3) the reference (or references when combined) must teach or suggest all of the claim limitations. The Applicants submit that a *prima facie* case of obviousness cannot be established in the present case because the cited references, either

when taken singularly or in combination, do not teach or suggest all of the limitations recited in Claim 6.

Claim 6 of the present application advantageously recites a fuel assembly comprising, among other features, a thimble screw comprising a drain hole having a first large inner diameter portion at a distal end side, a second large inner diameter portion at a seat side, and a small inner diameter portion between the first and the second large inner diameter portions. The Applicants submit that the cited references, either when taken singularly or in combination, do not teach or suggest all of the above limitations.

The Applicants note that the Danielson et al. reference describes a flow path in a water rod of a boiling water reactor (BWR), and does not relate to a thimble screw of a pressurized water reactor (PWR). The water rod of the BWR is different from the thimble screw of the PWR in that a control rod is not inserted during a scram, and no function to decrease a velocity of the control rod during the scram is required. Therefore, there is no inevitability in combining the invention of the Danielson et al. reference related to the water rod of the BWR having a completely different function from that required in the thimble screw of the PWR with Figures 2A and 2B. One of ordinary skill in the art would not have looked to the Danielson et al. reference to solve any problems associated with the configuration shown in Figures 2A and 2B, since the two different types of reactors are essentially non-analogous art with respect to the features being combined, and would not have thought to combine these features. Thus, Claims 6 and 7 of the present application are

not obvious from Figures 2A and 2B and the Danielson et al. reference even to a person skilled in the art.

Since a *prima facie* case of obviousness cannot be established in the present case for Claim 6, the Applicants respectfully request the withdrawal of the obviousness rejection of Claim 6.

Claim 7 is considered allowable for the reasons advanced for Claim 6 from which it depends. This claim is further considered allowable as it recites other features of the invention that are neither disclosed nor suggested by the applied references when those features are considered within the context of Claim 6.

Claims 6 and 7 were rejected under 35 U.S.C. 103(a) as being unpatentable over APA in view of JP 2002-40182. For the reasons discussed below, the Applicants request the withdrawal of this obviousness rejection.

The Applicants note that JP 2002-40182 was published on February 6, 2002. However, the present application claims foreign priority to JP 2001-107148, JP 2001-129035, and JP 2002-013333, which were all filed prior to the publication of JP 2002-40182, on February 6, 2002. Furthermore, the Applicants have submitted concurrently herewith English language translations of each of the foreign priority documents for the present application, thereby perfecting foreign priority. Thus, the foreign priority documents antedate the JP 2002-40182 reference and have been perfected, thereby removing the JP 2002-40182 as prior art. (See, e.g. MPEP 706.02(b).)

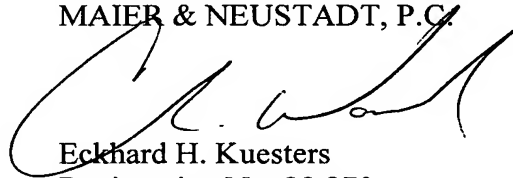
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Accordingly, the Applicants respectfully request the withdrawal of the obviousness rejection of Claims 6 and 7 citing the JP 2002-40182 reference.

Consequently, in view of the above discussion, it is respectfully submitted that the present application is in condition for formal allowance and an early and favorable reconsideration of this application is therefore requested.

Respectfully Submitted,

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